

02-13-06

AF 216

PTO/SB/21 (09-04)

Approved for use through 07/31/2006. OMB 0651-0031  
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

**TRANSMITTAL  
FORM**

(to be used for all correspondence after initial filing)

<b>TRANSMITTAL FORM</b> (to be used for all correspondence after initial filing)	Application Number	10/693,116	
	Filing Date	October 24, 2003	
	First Named Inventor	ANDREACO, et al.	
	Art Unit	1765	
	Examiner Name	Ahmed, Shamim	
Total Number of Pages in This Submission	30	Attorney Docket Number	25178.01

**ENCLOSURES (check all that apply)**

<input checked="" type="checkbox"/> Fee Transmittal Form <input checked="" type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/ Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____ <input type="checkbox"/> Landscape Table on CD	<input type="checkbox"/> After Allowance Communication to TC <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input checked="" type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): <b>Return Receipt Postcard</b>
<b>Remarks</b>		

**SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT**

Firm Name	Pitts and Brittan, P.C.		
Signature			
Printed Name	Jeffrey N. Outler		
Date	02/08/06	Reg. No.	35,486

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.

Signature			
Typed or printed name	Express Mail Number: EV 744992927 US	Date	

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11 and 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

Effective on 12/08/2004.

Fees pursuant to the Consolidated Appropriations Act, 2005 (H.R. 4818).

**FEE TRANSMITTAL  
For FY 2005**☐ Applicant claims small entity status. See 37 CFR 1.27.

TOTAL AMOUNT OF PAYMENT

(\$) 500

**Complete if Known**

Application Number	10/693,116
Filing Date	10/24/2003
First Named Inventor	ANDREACO et al.
Examiner Name	Shamim Ahmed
Art Unit	1765
Attorney Docket No.	25178.01

**METHOD OF PAYMENT (check all that apply)**☒ Check ☐ Credit card ☐ Money Order ☐ None ☐ Other (please identify):☒ Deposit Account Deposit Account Number: 16-1910 (25178.01) Deposit Account Name: Pitts and Brittan, P.C.

For the above-identified deposit account, the Director is hereby authorized to: (check all that apply)

☐ Charge fee(s) indicated below☐ Charge fee(s) indicated below, except for the filing fee☒ Charge any additional fee(s) or underpayments of fee(s)  
under 37 CFR 1.16 and 1.17☒ Credit any overpayments**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.**FEE CALCULATION****1. BASIC FILING, SEARCH, AND EXAMINATION FEES**

Application Type	FILING FEES		SEARCH FEES		EXAMINATION FEES		Fees Paid(\$)
	Fee (\$)	Small Entity	Fee (\$)	Small Entity	Fee (\$)	Small Entity	
Utility	300	150	500	250	200	100	
Design	200	100	100	50	130	65	
Plant	200	100	300	150	160	80	
Reissue	300	150	500	250	600	300	
Provisional	200	100	0	0	0	0	

**2. EXCESS CLAIM FEES****Fee Description**

	Small Entity
Each claim over 20 (including Reissues)	50
Each independent claim over 3 (including Reissues)	200
Multiple dependent claims	360

<b>Total Claims</b>	<b>Extra Claims</b>	<b>Fee (\$)</b>	<b>Fee Paid (\$)</b>
-20 or HP = -20	x		= 0

HP = highest number of total claims paid for, if greater than 20

<b>Indep. Claims</b>	<b>Extra Claims</b>	<b>Fee (\$)</b>	<b>Fee Paid (\$)</b>
-3 or HP = -3	x		= 0

HP = highest number of independent claims paid for, if greater than 3

**3. APPLICATION SIZE FEE**

If the specification and drawings exceed 100 sheets of paper (excluding electronically filed sequence or computer listings under 37 CFR 1.52(e)), the application size fee due is \$250 (\$125 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s).

<b>Total Sheets</b>	<b>Extra Sheets</b>	<b>Number of each additional 50 or fraction thereof</b>	<b>Fee (\$)</b>	<b>Fee Paid (\$)</b>
-100 = -100	/ 50 =	0	(round up to a whole number) x	= 0

**4. OTHER FEES**

Non-English Specificaion, \$130 fee (no small entity discount)

Other (e.g., late filing surcharge): Appeal Bried

500.00

**SUBMITTED BY**

Complete (if applicable)

Signature		Registration No. (Attorney/Agent)	35,486	Telephone	(865)584-0105
Name (Print/Type)	Jeffrey N. Cutler	Date	02/08/06		

This collection of information is required by 37 CFR 1.136. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P. O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P. O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl No. : 10/693,116 Confirmation No. 1623  
Applicant : Mark S. Andreaco  
Filed : 10/24/2003  
TC/A.U. : 1765  
Examiner : Ahmed, Shamim  
Docket No. : 25178.01  
Customer No. : 22465  
  
Assignee : CTI PET Systems, Inc.  
Title : Method for Producing a High Resolution Detector Array  
Express Mail : EV 744992927 US

Mail Stop Appeal Brief – Patents  
Commissioner for Patents  
P. O. Box 1450  
Alexandria VA 22313-1450

APPEAL BRIEF

Sir:

This Appeal Brief is filed on behalf of the Applicant in the above-referenced patent application in response to Paper Number 20050607 mailed on June 10, 2005. It is deemed to place the application in a condition for allowance.

02/14/2006 MAHMED1 00000005 10693116

01 FC:1402

500.00 OP

## TABLE OF CONTENTS

I.	Real Party in Interest.....	3
II.	Related Appeals and Interferences .....	3
III.	Status of Claims .....	3
IV.	Status of Amendments .....	4
V.	Summary of the Claimed Subject Matter .....	4
	A. ..INDEPENDENT CLAIM 1 .....	5
	B....INDEPENDENT CLAIM 17 .....	6
VI.	Grounds of Rejection to be Reviewed on Appeal.....	7
VII.	Argument .....	8
	A. ..REJECTIONS UNDER 35 U.S.C. §112, FIRST PARAGRAPH.....	8
	B....REJECTIONS UNDER 35 U.S.C. §112, SECOND PARAGRAPH .....	8
	C. ..REJECTIONS UNDER 35 U.S.C. §102.....	8
	D. ..REJECTIONS UNDER 35 U.S.C. §103.....	8
	1. <i>Claims 1-3, 7-10, 12 and 14-16</i> .....	11
	a) <i>Examiner's Rejection</i> .....	11
	b) <i>Appellants' Argument</i> .....	12
	2. <i>Claims 4-6 and 17-25</i> .....	16
	c) <i>Examiner's Rejection</i> .....	16
	d) <i>Appellants' Argument</i> .....	16
	3. <i>Claims 11 and 13</i> .....	18
	e) <i>Examiner's Rejection</i> .....	18
	f) <i>Appellants' Argument</i> .....	18
VIII.	Conclusion.....	18

## **I. Real Party in Interest**

This appeal is taken on behalf of CTI PET Systems, Incorporated, having a principal place of business at 810 Innovation Drive, Knoxville, Tennessee, 37932. CTI PET Systems, Inc., is the owner of record of the Application. All of the inventors have assigned their rights to CTI PET Systems, Inc., and the assignments have been recorded with the United States Patent and Trademark Office.

## **II. Related Appeals and Interferences**

There are no other appeals or interferences known by Appellants or Appellants' legal representative that will directly affect, be directly affected by, or have a bearing on the Board's decision in the pending appeal.

## **III. Status of Claims**

Claims 1 to 25 are presently pending in the Application. None of the claims have been amended. Claims 1 and 17 are independent claims in the application as originally filed and as now presented. Claims 2-16 depend, either directly or indirectly, from Claim 1. Claims 18-25 depend, either directly or indirectly, from Claim 17. Claims 1 and 17 are being appealed. It is respectfully submitted that a finding of patentability of such claims will render all claims in the present application patentable. For reference, a statement as to the status of each Claim prosecuted in the present application is presented:

Claim 1 (original) .....	Rejected 103(a)
Claim 2 (original) .....	Rejected 103(a)
Claim 3 (original) .....	Rejected 103(a)
Claim 4 (original) .....	Rejected 103(a)
Claim 5 (original) .....	Rejected 103(a)
Claim 6 (original) .....	Rejected 103(a)

Claim 7 (original) .....	Rejected 103(a)
Claim 8 (original) .....	Rejected 103(a)
Claim 9 (original) .....	Rejected 103(a)
Claim 10 (original) .....	Rejected 103(a)
Claim 11 (original) .....	neither rejected nor allowed
Claim 12 (original) .....	Rejected 103(a)
Claim 13 (original) .....	neither rejected nor allowed
Claim 14 (original) .....	Rejected 103(a)
Claim 15 (original) .....	Rejected 103(a)
Claim 16 (original) .....	Rejected 103(a)
Claim 17 (original) .....	Rejected 103(a)
Claim 18 (original) .....	Rejected 103(a)
Claim 19 (original) .....	Rejected 103(a)
Claim 20 (original) .....	Rejected 103(a)
Claim 21 (original) .....	Rejected 103(a)
Claim 22 (original) .....	Rejected 103(a)
Claim 23 (original) .....	Rejected 103(a)
Claim 24 (original) .....	Rejected 103(a)
Claim 25 (original) .....	Rejected 103(a)

#### **IV. Status of Amendments**

There have been no amendments to the claims entered in the Application on Appeal.

#### **V. Summary of the Claimed Subject Matter**

The invention detailed in the Claims of the present Application is a method for producing a high resolution detector array. Independent Claims 1 and 17 are involved in the present appeal.

### **A. Independent Claim 1**

The subject matter of independent Claim 1 includes a method for producing a high resolution detector array, the method comprising the steps:

cutting a first selected number of bars of scintillator material to a selected dimension;

polishing said selected number of bars;

coating said polished bars with an adhesive of a selected index of refraction;

laminating said polished bars together, wherein a thin reflective optical film is disposed between adjoining scintillator bars, wherein said optical film defines a reflector, whereby an assembly of laminated bars having a layer of said optical film between adjoining bars is formed;

allowing said laminated assembly to cure;

cutting a second group of said selected number of bars from said laminated assembly, wherein said cut is perpendicular to said polished bars, whereby each of said second group of cut bars comprises a laminated composite of said selected number of scintillator elements having a reflector interposed between adjoining scintillator crystals;

polishing said second group of said cut bars;

coating said second group of polished bars with said adhesive of said selected index of refraction;

laminating a second selected number of said second group of polished bars together, wherein a thin reflective optical film is disposed between adjoining scintillator bars, wherein said thin optical film defines a reflector, whereby a detector array of discrete scintillator crystals having a reflector disposed between adjoining discrete scintillator elements is formed.

The initial steps of cutting a first selected number of bars, and polishing, coating, laminating and curing the polished bars is disclosed in the specification at page 5, line 25, through page 6, line 18, and illustrated in FIGS. 2a-2c.

The final steps of cutting a second group of bars, and polishing, coating and laminating the polished bars is disclosed in the specification at page 6, line 18, through page 7, line 2, and illustrated in FIGS. 3a-3c.

**B. Independent Claim 17**

A method for producing a high resolution detector array, said method comprising the steps:

- cutting a first selected number of bars of scintillator material to a selected dimension, wherein a first half of said selected number of bars are cut from a scintillator material of a first selected decay time, and further wherein a second half of said selected number of bars are cut from a scintillator material of a second selected decay time;

- polishing said selected number of bars;

- coating said polished bars with an adhesive of a selected index of refraction;

- laminating said polished bars together such that a bar of said scintillator of said first selected decay time adjoins a bar of scintillator material of said second decay time whereby bars of different decay times are laminated together in an alternating pattern, wherein a thin polyethylene optical film is disposed between adjoining scintillator bars, wherein said optical film defines a reflector, whereby an assembly of laminated bars having a layer of said optical film between adjoining bars is formed;

- allowing said laminated assembly to cure;

- cutting a second group of said selected number of bars from said laminated assembly, wherein said cut is perpendicular to said polished bars, whereby each of said second group of cut bars comprises a laminated composite of said selected number of



scintillator elements having a reflector interposed between adjoining scintillator crystals;

polishing said second group of said cut bars;

coating said second group of polished bars with said adhesive of said selected index of refraction;

laminating a second selected number of said second group of polished bars together, wherein a thin polyethylene film is disposed between adjoining scintillator bars, wherein said thin optical film defines a reflector, wherein said step of laminating said second group of polished bars together is carried out such that a checkerboard pattern of alternating scintillation crystals of different decay times is formed, whereby a detector array of discrete scintillator crystals having a reflector disposed between adjoining discrete scintillator elements is formed.

The initial steps of cutting a first selected number of bars from scintillating materials of first and second decay times, and polishing, coating, laminating in alternate fashion and curing the polished bars is disclosed in the specification at page 7, lines 3-17, and illustrated in FIGS. 4a-4c.

The final steps of cutting a second group of bars, and polishing, coating and laminating the polished bars is disclosed in the specification at page 7, line 17, through page 8, line 2, and illustrated in FIGS. 5a-5c.

## **VI. Grounds of Rejection to be Reviewed on Appeal**

The examiner made the following rejections in the present application, each of which is to be reviewed on appeal.

The examiner rejected claims 1-3, 7-10, 12 and 14-16 under 35 U.S.C. § 103(a) as being unpatentable over U. S. Patent No. 6,245,184 ("the '184 patent"), issued to Riedner *et al.*, in view of U. S. Patent No. 6,236,710 ("the '710 patent"), issued to Wittry.

The examiner rejected Claims 4-6 and 17-25 under 35 U.S.C. § 103(a) as being unpatentable over the '184 patent in view of the '184 and '710 patents, and further in view of U. S. Patent No. 4,879,465 ("the '465 patent"), issued to Persyk *et al.*

The examiner has neither rejected, objected to, nor allowed Claims 11 and 13 in the examiner's final office action. Appellants appeal to the Board for a determination of patentability of such claims.

## **VII. Argument**

### **A. Rejections under 35 U.S.C. §112, first paragraph**

There are no rejections for any presently pending Claim under 35 U.S.C. §112, first paragraph.

### **B. Rejections under 35 U.S.C. §112, second paragraph**

There are no rejections for any presently pending Claim under 35 U.S.C. §112, second paragraph.

### **C. Rejections under 35 U.S.C. §102**

There are no rejections for any presently pending Claim under 35 U.S.C. §102.

### **D. Rejections under 35 U.S.C. §103**

#### The Law of Obviousness

35 U.S.C. §103(a) reads:

A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having

ordinary skill in the art to which said subject matter pertains.  
Patentability shall not be negated by the manner in which the  
invention was made.

35 U.S.C. §103(a) (2004).

A rejection under 35 U.S.C. § 103(a) must be supported by a *prima facie* case of obviousness. MPEP § 2142. Section 2143 of the Manual of Patent Examining Procedure summarizes the standards for a *prima facie* case of obviousness under 35 U.S.C. §103. The first element is that "there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings." MPEP § 2143. The second element is that "there must be a reasonable expectation of success." *Id.* The third element is that "the prior art reference (or references when combined) must teach or suggest all the claim limitations." *Id.* The expectation of success and the motivation to combine the references "must both be found in the prior art, not in the applicants disclosure." *In re Vaeck*, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991).

"There are three possible sources for a motivation to combine references: the nature of the problem to be solved, the teachings of the prior art, and the knowledge of persons of ordinary skill in the art." *In re Rouffet*, 47 U.S.P.Q.2d 1453, 1457-58 (Fed. Cir. 1998) (The combination of the references taught every element of the claimed invention, however without a motivation to combine, a rejection based on a *prima facie* case of obvious was held improper); *see* MPEP § 2143.01. "Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability--the essence of hindsight." *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999).

The standard of review applied to findings of fact is the "substantial evidence" standard under the Administrative Procedure Act (APA). *See In re Gartside*, 203 F.3d

1305,1315,53 U.S.P.Q.2d 1769,1775 (Fed. Cir. 2000); *see also* MPEP 2144.03, pg. 2100-136, 8th ed., rev. 2. There must be some form of evidence in the record to support an assertion of common knowledge. *See In re Lee*, 277 F.3d 1338, 1344-45, 61 U.S.P.Q.2d 1430, 1434-35 (Fed. Cir. 2002); *In re Zurko*, 258 F.3d 1379, 1386, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001); *see also* MPEP 2144.03, pg. 2100-137, 8th ed., rev. 2. "With respect to core factual findings in a determination of patentability, however, the Board cannot simply reach conclusions based on its own understanding or experience -- or on its assessment of what would be basic knowledge or common sense. Rather, the Board must point to some concrete evidence in the record in support of these findings." *In re Zurko*, 258 F.3d 1379, 1386, 59 U.S.P.Q.2d 1693, 1697 (Fed. Cir. 2001).

The United States Supreme Court has held that the relevant facts for finding obviousness relate to (1) the scope and content of the prior art, (2) the level of ordinary skill in the field of the invention, (3) the differences between the claimed invention and the prior art, and (4) any objective evidence of nonobviousness such as long felt need, commercial success, the failure of others, or copying. *Graham v. John Deere Co.* 148 U.S.P.Q. 459, 467 (U.S. 1966). The *Graham* Court stated that "the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved." *Id.* at 467. The *Graham* court further stated that "[s]uch secondary considerations as commercial success, long felt but unsolved needs, failure of others, etc., might be utilized to give light to the circumstances surrounding the origin of the subject matter sought to be patented. As indicia of obviousness or nonobviousness, these inquiries may have relevancy." *Id.*

1. *Claims 1-3, 7-10, 12 and 14-16*

a) *Examiner's Rejection*

With respect to Claims 1-3, 7-10, 12 and 14-16, in the Examiner's final Office Action the Examiner states:

6. Claims 1-3, 7-10, 12, 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riedner et al (6,245,184) in view of Wittry (6,236,710).

Riedner et al teach a process of forming a high-resolution detector by cutting a first number of bars of scintillator with desired dimension; arranging the bars (110) in an array and laminating the bars together with adhesive and introducing a reflector material in between the two scintillator bars (col. 3, lines 5-16).

Riedner et al also teach that cutting a second group of bars (118) from the formed assembly, wherein the cut is perpendicular to the bars and a reflector material (114) is disposed in between the bars (col. 3, lines 16-46 and figure 5).

Riedner et al teach that laminating second group of bars together having reflector material between the adjoining scintillator bars (col. 3, lines 48-63 and figure 6).

Riedner et al fail to explicitly teach the introduction of a polishing step after the cutting step.

However, in a method of manufacturing optical device, Wittry teaches after cleaving a crystal, it is important that the surface be damage free and can be accomplished by etching or polishing or mechanical polishing (col. 4, lines 32-37).

Therefore, it would have been obvious to one of ordinary skill in the art at the claimed invention to combine Wittry's teaching into Riedner et al's process for providing a [sic] damage free crystal bars for efficiently laminating the bars together as taught by Wittry.

*b) Appellants' Argument*

For purposes of the present appeal, Appellants remarks are drawn toward independent Claim 1.

Applicants respectfully submit that the combination of the '184 and '710 patents does not yield the claimed invention of the present application. There is no motivation to combine such references to accomplish the present invention. Nor is there a reasonable expectation of success of accomplishing the present invention in making such combination.

Riedner *et al.*, disclose a method of fabricating scintillators using an inner diameter (ID) saw. Riedner *et al.*, disclose that a "plurality of scintillators are stacked and cut with the ID saw to form a plurality of first bars. The first bars are placed in a fixture creating a gap which is filled with a cast reflector material. The first bars are then cut with the ID saw at a 90 degree angle to the pieces creating second bars. The second bars are placed in a fixture and spaced to create second gaps similar to the first gaps. The second gaps are filled similar to the first gaps with a cast reflector material forming scintillator array." (see ABSTRACT). Riedner *et al.*, further disclose that during fabrication, "scintillator wafers 100 are temporally bonded together using a low melting point adhesive, dissolvable adhesive, or other temporary adhesive (not shown) to form a stack 104. ... After cutting, the temporary adhesive bond is broken and first bar stacks 108 are separated into first bars 110." (see Col. 2, line 62 - Col. 3, line 8).

While Riedner *et al.*, teach the bonding of the scintillator wafers in order to cut the scintillators, the properties of the adhesive are of no concern with the exception that the bonding agent is dissolvable or otherwise temporary. Riedner *et al.*, do not teach that use of a bonding agent with selected optical properties in order to tune the scintillator block. Nor do Reidner *et al.*, disclose the application of an optical film between layers of scintillators.

In the present application, an optical film is adhered between scintillator crystals using a selected adhesive. Both the optical film and the adhesive are selected in order to tune the scintillator detector array. See, for example, page 7, lines 1 and 2, which states, in part "the detector array can be tuned by selecting the thickness of the optical film 40 thereby allowing selective transmission of light through optical film 40." Further, see page 6, lines 23-24, which states in part "the polished bars are coated with an adhesive of selected index of refraction..." The final product, as claimed, is a detector array having an array of discrete elements having a layer of adhesive, a reflective optical film, and another layer of adhesive disposed between adjacent of said discrete elements.

Riedner *et al.*, do not disclose at least the steps of:

polishing said selected number of bars (as admitted by the examiner);

coating the polished bars with an adhesive of a selected index of refraction;

laminating the polished bars together, wherein a thin reflective optical film is disposed between adjoining scintillator bars, wherein said optical film defines a reflector, whereby an assembly of laminated bars having a layer of said optical film between adjoining bars is formed;

allowing the laminated assembly to cure;

repeating these steps in a second direction in order to form the array of the present invention.

Specifically taught by Reidner *et al.*, is the removal of the temporary adhesive and the placement of the individual elements into a spaced arrangement and then the spaces filled with a cast reflective material. Those skilled in the art recognize that such material is used to isolate each element from each other element, thereby preventing cross talk.

While the optical film used and claimed in the present invention is described as being reflective, it is also provided to allow selected transmission of light as discussed above, thereby permitting cross talk between the adjacent elements. Accordingly, it is respectfully submitted that Reidner *et al.*, teach away from the present invention.

In order to maintain the examiner's rejection, it must be shown that Wittry teaches those elements not disclosed by Reidner *et al.*, and if such elements are disclosed by Wittry, that one skilled in the art would be motivated to make such combination, and finally, that there would be a reasonable expectation for success in making such combination. As the examiner has indicated, Wittry discloses that "it is important that the surface be damage free. This may be accomplished by etching or by chemical polishing after cutting and mechanical polishing." (see Col. 4, lines 35-37). In the present invention, it has not been disclosed nor claimed that a "damage free" surface be accomplished. On the contrary, it is understood by those skilled in the art that "polishing" does not typically mean that the surface being polished is "damage free," but that internal trapping of light is minimized. Surface irregularities may remain in order to change the reflection or refraction of light, which aids in the tuning of the crystal.



Even if Wittry were held to teach the step of polishing the scintillator bars as claimed in the present application, it is respectfully submitted that Wittry fails to teach at least the steps of:

coating the polished bars with an adhesive of a selected index of refraction;

laminating the polished bars together, wherein a thin reflective optical film is disposed between adjoining scintillator bars, wherein said optical film defines a reflector, whereby an assembly of laminated bars having a layer of said optical film between adjoining bars is formed;

allowing the laminated assembly to cure; and

repeating these steps in a second direction in order to form the array of the present invention.

As indicated above, Riedner *et al.*, also failed to disclose such limitations. Accordingly, even if there were motivation in the prior art to combine the Riedner *et al.*, and Wittry patents, and even if there were reasonable expectation of success in combining such references, it is respectfully submitted that the two references do not teach all of the claimed elements of independent Claim 1.

Accordingly, it is respectfully submitted that the combination of the '184 and '710 patents as set forth above does not make obvious the invention as claimed in Claims 1-3, 7-10, 12 and 14-16. Therefore, it is respectfully submitted that the examiner's rejection of such claims under 35 U.S.C. 103(a) has been traversed.

2. *Claims 4-6 and 17-25*

c) *Examiner's Rejection*

With respect to Claims 4-6 and 17-25, in the Examiner's final Office Action the Examiner states:

7. Claims 4-6 and 17-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Riedner et al (6,245,184) in view of Wittry (6,236,710) as applied to claims 1-3,7-10,12,14-16 above and further in view of Persyk et al (4,879,465).

Modified Riedner et al discussed above in the paragraph 6 but fail to teach forming the detector by bonding together scintillator crystals with different decay times in an alternating pattern.

However, Persyk et al teach forming a high-resolution detector by bonding two different scintillator material having distinguishable decay time in an alternate fashion (col. 2, lines 11-18 and col. 2, lines 65-col. 3, line 3 and abstract) and such arrangement minimizing the edge packing problem.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of claimed invention to combine Persyk et al's teaching into modified Riedner et al's process for advantageously forming a detector with reduced edge packing problem as taught by Persyk et al.

d) *Appellants' Argument*

Claims 4-6 are deemed allowable as depending from allowable base Claim 1. For purposes of the present appeal, Appellants remarks are drawn toward independent Claim 17. Appellants incorporate herein the above analysis of the Riedner *et al.*, and Wittry patents.

Persyk *et al.*, disclose a detector module for use in scintillation cameras using a plurality of elongated scintillator strips for establishing a temperature gradient. Persyk *et al.*, specifically teach away from the present invention in that they state, at Col. 2, lines 4-10:

While the use of a photomultiplier tube is common in scintillation camera detectors, the use of the tube in this application is unique because the tube is not used to measure anything except the energy of the scintillation event and the decay time of the event. There is no weighting of the signals from a plurality of photomultiplier tubes.

Notwithstanding the admitted divergence from the subject matter of the present invention, Persyk *et al.*, fail to disclose at least those elements lacking in the teaching of the cited prior art and claimed in the present invention. Namely, Persyk *et al.*, fail to disclose at least the steps of:

coating the polished bars with an adhesive of a selected index of refraction;

laminating the polished bars together, wherein a thin reflective optical film is disposed between adjoining scintillator bars, wherein said optical film defines a reflector, whereby an assembly of laminated bars having a layer of said optical film between adjoining bars is formed;

allowing the laminated assembly to cure; and

repeating these steps in a second direction in order to form the array of the present invention.

Accordingly, it is respectfully submitted that the combination of the '184, '710 and '465 patents as set forth above does not make obvious the invention as claimed in

Claim 17. Therefore, it is respectfully submitted that the examiner's rejection of such claims under 35 U.S.C. 103(a) has been traversed.

3. *Claims 11 and 13*

e) *Examiner's Rejection*

In the Examiner's final Office Action, the Examiner made no rejection of nor objection to, Claims 11 and 13.

f) *Appellants' Argument*

The only rejection of Claims 11 and 13 in the prosecution of the present application was a under the judicially-created doctrine of obviousness-type double patenting as being unpatentable over Claims 1-20 of U. S. Patent No. 6,749,761. The double patenting rejection was made in the examiner's first office action dated November 24, 2004, and was overcome by the execution of a Terminal Disclaimer filed on May 23, 2005. The Terminal Disclaimer was accepted, as indicated at page 3, paragraph 3, of the examiner's final office action dated June 10, 2005.

Without having been provided a substantive ground of rejection or an indication of allowability, it is respectfully submitted that Appellants have not been provided an opportunity to respond to any such substantive grounds the examiner might have. However, in view of the examiner's duty to examine each claim, and in view of the examiner's prior rejection of Claims 11 and 13 under the judicially-created doctrine of obviousness-type double patenting, it is presumed that Claims 11 and 13 are deemed allowable by the examiner.

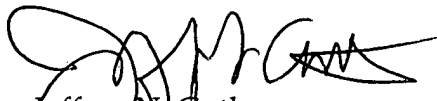
## **VIII. Conclusion**

Appellants respectfully request that the Board overturn the rejection of Claims 1-3, 7-10, 12 and 14-16 under 35 U.S.C. § 103(a) based on U. S. Patent No. 6,245,184,

issued to Riedner *et al.*, in view of U. S. Patent No. 6,236,710, issued to Wittry. Further, Appellants respectfully request that the Board overturn the rejection of Claims 4-6 and 17-25 under 35 U.S.C. § 103(a) as being unpatentable over the '184 patent in view of the '710 patent, and further in view of U. S. Patent No. 4,879,465, issued to Persyk *et al.* Accordingly, Appellants respectfully request that the Board remand the application to the examiner with instructions to issue a Notice of Allowance. In the alternative, Appellant's respectfully request the Board remand the application to the examiner with instructions to render a determination of patentability of Claims 11 and 13.

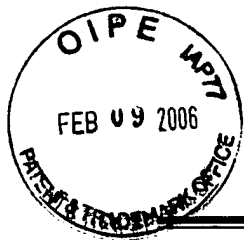
Please charge any additional fees associated with this communication, or credit any overpayment, to Deposit Account No. 16-1910.

Respectfully submitted,



Jeffrey N. Cutler  
Registration Number 35,486

PITTS AND BRITTIAN, P.C.  
P.O. Box 51295  
Knoxville, Tennessee 37950-1295  
(865) 584-0105 Voice  
(865) 584-0104 Fax



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl No. : 10/693,116 Confirmation No. 1623  
Applicant : Mark S. Andreaco  
Filed : 10/24/2003  
TC/A.U. : 1765  
Examiner : Ahmed, Shamim  
Docket No. : 25178.01  
Customer No. : 22465  
  
Assignee : CTI PET Systems, Inc.  
Title : Method for Producing a High Resolution Detector Array  
Express Mail : EV 744992927 US

Mail Stop Appeal Brief – Patents  
Commissioner for Patents  
P. O. Box 1450  
Alexandria VA 22313-1450

APPEAL BRIEF  
APPENDIX A – LISTING OF CLAIMS

1 Claim 1 (original): A method for producing a high resolution detector array,  
2 said method comprising the steps:  
3 cutting a first selected number of bars of scintillator material to a selected  
4 dimension;  
5 polishing said selected number of bars;  
6 coating said polished bars with an adhesive of a selected index of refraction;  
7 laminating said polished bars together, wherein a thin reflective optical film  
8 is disposed between adjoining scintillator bars, wherein said optical film defines a  
9 reflector, whereby an assembly of laminated bars having a layer of said optical film  
10 between adjoining bars is formed;  
11 allowing said laminated assembly to cure;

12 cutting a second group of said selected number of bars from said laminated  
13 assembly, wherein said cut is perpendicular to said polished bars, whereby each of  
14 said second group of cut bars comprises a laminated composite of said selected  
15 number of scintillator elements having a reflector interposed between adjoining  
16 scintillator crystals;  
17 polishing said second group of said cut bars;  
18 coating said second group of polished bars with said adhesive of said selected  
19 index of refraction;  
20 laminating a second selected number of said second group of polished bars  
21 together, wherein a thin reflective optical film is disposed between adjoining  
22 scintillator bars, wherein said thin optical film defines a reflector, whereby a detector  
23 array of discrete scintillator crystals having a reflector disposed between adjoining  
24 discrete scintillator elements is formed.

1 Claim 2 (original): The method of claim 1 wherein each of said selected number  
2 of bars is cut from a single scintillator material.

1 Claim 3 (original): The method of claim 1 wherein said first selected number of  
2 bars is equal to said second selected number of said second group of polished bars.

1 Claim 4 (original): The method of claim 2 wherein said single scintillator material  
2 comprises a first layer having a first selected decay time optically bonded to a second  
3 layer having a second selected decay time.

1 Claim 5 (original): The method of claim 1 wherein a first half of said first selected  
2 number of bars are cut from a scintillator material of a first selected decay time, and  
3 further wherein a second half of said first selected number of bars are cut from a  
4 scintillator material of a second selected decay time.

1 Claim 6 (original): The method of claim 1 wherein a first half of said first selected  
2 number of bars are cut from a first scintillator material comprising a first layer having a

3 first selected decay time optically bonded to a second layer having a second selected  
4 decay time, and further wherein a second half of said first selected number of bars are  
5 cut from a second scintillator material comprising a first layer having a first selected  
6 decay time optically bonded to a second layer having a second selected decay time.

1 Claim 7 (original): The method of claim 1 wherein said steps of polishing are  
2 carried out by chemically etching said selected number of bars.

1 Claim 8 (original): The method of claim 1 wherein said steps of polishing are  
2 carried out by mechanical polishing.

1 Claim 9 (original): The method of Claim 1 wherein said adhesive of a selected  
2 index of refraction is selected from a group consisting of epoxies, silicon based adhesives  
3 and silicon based encapsulants.

1 Claim 10 (original): The method of claim 1 wherein said adhesive is selected from  
2 a group consisting of Epotek 301-2, Sylgard 186, Sylgard 184, GE 656 and GE 615.

1 Claim 11 (original): The method of claim 5 wherein said step of laminating said  
2 polished bars together is carried out such that a bar of said scintillator of said first  
3 selected decay time adjoins a bar of scintillator material of said second decay time  
4 whereby bars of different decay times are laminated together in an alternating pattern.

1 Claim 12 (original): The method of claim 1 wherein said optical film is loaded  
2 with a reflective material selected from a group consisting of BaSO<sub>4</sub>, MgO, SiO<sub>2</sub>,  
3 powdered Teflon, CaCO<sub>3</sub> and TiO<sub>2</sub>.

1 Claim 13 (original): The method of claim 11 wherein said step of laminating said  
2 second group of polished bars together is carried out such that a checkerboard pattern of  
3 alternating scintillation crystals of different decay times is formed.

1 Claim 14 (original): The method of claim 1 wherein said optical film is a mono-  
2 layer film.



1           Claim 15 (original): The method of claim 1 wherein said optical film is a multi-  
2 layer film.

1           Claim 16 (original): The method of claim 1 wherein said optical film is selected  
2 from a group consisting of polyester film and polyethylene film.

1           Claim 17 (original): A method for producing a high resolution detector array,  
2 said method comprising the steps:

3           cutting a first selected number of bars of scintillator material to a selected  
4 dimension, wherein a first half of said selected number of bars are cut from a scintillator  
5 material of a first selected decay time, and further wherein a second half of said selected  
6 number of bars are cut from a scintillator material of a second selected decay time;

7           polishing said selected number of bars;

8           coating said polished bars with an adhesive of a selected index of refraction;

9           laminating said polished bars together such that a bar of said scintillator of said  
10 first selected decay time adjoins a bar of scintillator material of said second decay time  
11 whereby bars of different decay times are laminated together in an alternating pattern,  
12 wherein a thin polyethylene optical film is disposed between adjoining scintillator bars,  
13 wherein said optical film defines a reflector, whereby an assembly of laminated bars  
14 having a layer of said optical film between adjoining bars is formed;

15          allowing said laminated assembly to cure;

16          cutting a second group of said selected number of bars from said laminated  
17 assembly, wherein said cut is perpendicular to said polished bars, whereby each of said  
18 second group of cut bars comprises a laminated composite of said selected number of  
19 scintillator elements having a reflector interposed between adjoining scintillator crystals;

20          polishing said second group of said cut bars;

21          coating said second group of polished bars with said adhesive of said selected  
22 index of refraction;

23           laminating a second selected number of said second group of polished bars  
24 together, wherein a thin polyethylene film is disposed between adjoining scintillator  
25 bars, wherein said thin optical film defines a reflector, wherein said step of laminating  
26 said second group of polished bars together is carried out such that a checkerboard  
27 pattern of alternating scintillation crystals of different decay times is formed, whereby a  
28 detector array of discrete scintillator crystals having a reflector disposed between  
29 adjoining discrete scintillator elements is formed.

1           Claim 18 (original): The method of claim 17 wherein said first selected number of  
2 bars is equal to said second selected number of said second group of polished bars.

1           Claim 19 (original): The method of claim 17 wherein said single scintillator  
2 material comprises a first layer having a first selected decay time optically bonded to a  
3 second layer having a second selected decay time.

1           Claim 20 (original): The method of claim 17 wherein a first half of said first  
2 selected number of bars are cut from a first scintillator material comprising a first layer  
3 having a first selected decay time optically bonded to a second layer having a second  
4 selected decay time, and further wherein a second half of said first selected number of  
5 bars are cut from a second scintillator material comprising a first layer having a first  
6 selected decay time optically bonded to a second layer having a second selected decay  
7 time.

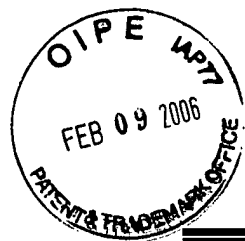
1           Claim 21 (original): The method of claim 17 wherein said steps of polishing are  
2 carried out by chemically etching said selected number of bars.

1           Claim 22 (original): The method of claim 17 wherein said steps of polishing are  
2 carried out by mechanical polishing.

3           Claim 23 (original): The method of Claim 17 wherein said adhesive of a selected  
4 index of refraction is selected from a group consisting of epoxies, silicon based adhesives  
5 and silicon based encapsulants.

1           Claim 24 (original): The method of claim 17 wherein said adhesive is selected  
2 from a group consisting of Epotek 301-2, Sylgard 186, Sylgard 184, GE 656 and GE 615.

1           Claim 25 (original): The method of claim 17 wherein said optical film is loaded  
2 with a reflective material selected from a group consisting of BaSO<sub>4</sub>, MgO, SiO<sub>2</sub>,  
3 powdered Teflon, CaCO<sub>3</sub> and TiO<sub>2</sub>.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

---

Appl No. : 10/693,116 Confirmation No. 1623  
Applicant : Mark S. Andreaco  
Filed : 10/24/2003  
TC/A.U. : 1765  
Examiner : Ahmed, Shamim  
Docket No. : 25178.01  
Customer No. : 22465  
  
Assignee : CTI PET Systems, Inc.  
Title : Method for Producing a High Resolution Detector Array  
Express Mail : EV 744992927 US

---

Mail Stop Appeal Brief – Patents  
Commissioner for Patents  
P. O. Box 1450  
Alexandria VA 22313-1450

**APPEAL BRIEF**  
**APPENDIX B – EVIDENCE**

Appellants provide no evidence submitted pursuant to 37 CFR §§ 1.120, 1.131 or 1.132. Further, appellants provide no evidence entered by the examiner and relied upon by the appellants in this appeal.



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

---

Appl No. : 10/693,116 Confirmation No. 1623  
Applicant : Mark S. Andreaco  
Filed : 10/24/2003  
TC/A.U. : 1765  
Examiner : Ahmed, Shamim  
Docket No. : 25178.01  
Customer No. : 22465  
  
Assignee : CTI PET Systems, Inc.  
Title : Method for Producing a High Resolution Detector Array  
Express Mail : EV 744992927 US

---

Mail Stop Appeal Brief – Patents  
Commissioner for Patents  
P. O. Box 1450  
Alexandria VA 22313-1450

**APPEAL BRIEF**  
**APPENDIX C – RELATED PROCEEDINGS**

There are no decisions rendered by a court or the Board in any proceedings identified pursuant to 37 CFR § 41.39(c)(1)(ii).